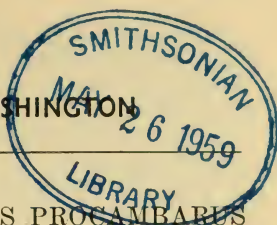


PROCEEDINGS
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A NEW CRAYFISH OF THE GENUS *PROCAMBARUS*
FROM ALABAMA¹ (DECAPODA, ASTACIDAE)

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The new crayfish described below was collected from eight localities in the vicinity of Montgomery, Alabama, some 200 miles east of the single locality in which its closest relative, *Procambarus jaculus*, was found. The two species occur at approximately the same degree of latitude, and there is evidence that both are secondary burrowing species (Hobbs, 1942: 20), associated with temporary bodies of water.

We have named this crayfish in honor of our good friend, Dr. Ivey F. Lewis, former Director of the Mountain Lake Biological Station, who has aided and encouraged us in our studies for many years.

Procambarus lewisi, sp. nov.

Diagnosis.—Rostrum without marginal spines; postorbital ridges weak and without spines or tubercles; suborbital angle weak or rounded; lateral surface of carapace tuberculate with a single one larger than others immediately caudal to cervical groove; areola 13 to 24 times longer than broad and constituting 32.1 to 37.3 per cent of entire length of carapace. Simple hooks present on ischiopodites of third pereopods in male, those on fourth bituberculate or knobbed. Palm of chela not bearded but with a row of seven to 11 tubercles. First pleopod of first form male with a slight shoulder on cephalic margin at base of distal seventh; mesial process non-corneous, slender, and extending caudodistad beyond the tips of the other terminal elements; cephalic process slender, lying cephalolateral to the central projection, tip corneous, and projecting distally; caudal process, a corneous, plate-like, sinuous projection, extends almost beak-like, and directed caudodistad but tilted slightly laterad. laterodistally across the caudolateral portion of the terminal end of pleopod; central projection, the largest of the terminal elements, corneous, Annulus ventralis movable with a prominent pair of caudolaterally directed arms; central area elevated (ventrally) with a longitudinal furrow in cephalic half; sinus, originating in cephalic furrow, S-shaped caudally.

Holotype Male, Form I.—Body subovate with the greatest length in

¹Contribution from the Mountain Lake Biological Station and the Department of Biology, University of Virginia.

the dorso-ventral plane; abdomen and carapace subequal in length (31.5 and 31.4 mm.). Height in region of caudodorsal margin of cervical groove slightly less than width; greatest width of carapace slightly caudal to caudodorsal margin of cervical groove.

Areola about 23.4 times longer than broad with one or two punctations in narrowest part. Cephalic section of carapace about 1.7 times as long as areola (length of areola about 37.9 per cent of entire length of carapace).

Rostrum without marginal spines; margins only slightly elevated, a little thickened basally, and converging to a small indistinctly delimited acumen. Upper surface subplane basally and slightly concave cephalically with scattered punctations and with a row of them mesial to margins. No carina present. Postorbital angle obtuse and rounded. Subrostral ridges evident along basal third of rostrum. Branchiostegal spine very small but acute. Lateral surface of carapace granulate and with one tubercle slightly larger than other granulations on each side just caudal to cervical groove. Dorsal surface of carapace punctate. Cephalic section of telson with two spines in each caudolateral angle.

Epistome (Fig. 10) broader than long, its margins with a few small tubercles; cephalic border without a median projection. Antennules of the usual form with a small spine on lower surface of basal segment. Antennae broken. Antennal scale (Fig. 11) broad; broadest slightly distal to mid-length; lateral portion inflated, slightly convex laterally, and terminating distally in an acute spine; total length almost half that of areola (5.6 and 11.7 mm.).

Left chela (Fig. 7) with palm inflated and with setiferous squamous tubercles present on all surfaces. Inner margin of palm with a row of nine tubercles; below this row another consisting of seven tubercles; tubercles above this row somewhat more irregularly arranged; prominent tubercle on lower surface of palm at base of dactylopodite. Both fingers with moderately well defined, longitudinal, polished ridges above and below. Opposable margin of immovable finger with a row of 11 tubercles, the fourth from the base largest; below the distalmost tubercle in this row lies a very prominent one and a smaller one distal to the latter. Opposable margin of dactylopodite with two rows of tubercles, an upper one of 17 very small ones and a lower of nine; lower row originates at distal end of proximal fourth of finger and the proximal tubercle is largest. Crowded minute denticles present along distal half of opposable margins of both fingers and interspersed among the proximal tubercles. Setiferous punctations covering both fingers except for polished ridges and at base of dactylopodite where small tubercles are present.

Carpopodite of first left pereopod tuberculate mesially and punctate on other surfaces. In addition to the usual arc of large tubercles along distal border, several smaller ones on mesial surface proximal to the large mesial one. Upper surface with a broad shallow oblique furrow. Mero-podite tuberculate above, below, and mesiodistally; one tubercle on upper distal surface larger than others on upper surface; lower surface with the usual two rows, although lateral row somewhat irregular and both rows flanked by others on each side; the more regular mesial row consists of 15 tubercles. Lower surface of ischiopodite with a row of five tubercles.

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Ischiopodites of third and fourth pereopods with hooks (Figs. 8, 9); that on third simple and that on fourth bituberculate; neither opposed by a knob-like prominence on corresponding basipodite. Coxopodite of fourth pereopod with a caudomesially projecting knob on caudomesial angle, and that of fifth with a ventrally directed projection near caudomesial angle.

First pleopods (Figs. 1, 5) symmetrically arranged and extending to coxopodite of third pereopod when abdomen is flexed. Tip terminating in four distinct parts, three of which are corneous. No setae on distal half of appendage. For description see *Diagnosis*.

Morphotypic Male, Form II.—Differs from the holotype in the following respects: suborbital angles obsolete; epistome with a small cephalomedian projection; antenna extends caudad to base of third abdominal segment; inner margin of palm of chela with a row of seven or eight tubercles; opposable margins of fingers of chela with a single row of minute denticles, as opposed to crowded ones; hooks and prominences on proximal podomeres of pereopods all reduced, and hook on ischiopodite of fourth pereopod with no indication of the bituberculate condition. First pleopod (Figs. 2, 4) with all terminal elements represented; however, none corneous, and all shortened. An oblique transverse suture is present in the basal half of the appendage. See measurements.

Allotypic Female.—Differs from the holotype in the following respects: epistome broadly triangular with a small cephalomedian projection; inner margin of palm of chela with a row of eight tubercles; opposable margins of fingers of chela with a single row of minute denticles as in morphotype, but forming a knife-like edge; cephalic section of telson with three spines in the caudosinistral angle. Annulus ventralis (Fig. 6) movable and not covered in part by sternum immediately cephalic to it. See *Diagnosis* for description; also see measurements.

Measurements.—(In. mm.).		Morpho- type		
		Holotype	Allotype	
Carapace:	height	15.1	10.9	10.6
	width	15.5	10.9	10.6
	length	31.4	22.5	22.2
Areola:	width	0.5	0.4	0.4
	length	11.7	7.9	7.5
Rostrum:	width	5.1	4.0	3.9
	length	7.0	6.5	5.4
Chela:	length of inner margin of palm	11.1	4.2	4.2
	width of palm	8.9	3.9	3.9
	length of outer margin of hand	31.3	12.8	12.6
	length of dactyl	18.2	7.6	7.1

Type Locality.—Roadside ditch 18.8 miles east of Montgomery, Macon County, Alabama, on Route 80. Here the ditch is some six feet wide and the muddy water ranged from a few inches to more than four feet in depth in some places. Grasses grew along the margins of the ditch and filamentous algae were abundant. At 12:45 P.M. on April 16, 1958, the temperature of the water was 12°C. The only other crayfish collected in this locality was *Procambarus acutissimus* Girard.

Disposition of Types.—The holotype, allotype, and morphotype are deposited in the U. S. National Museum (nos. 102467, 102468, and 102469, respectively). The paratype series consists of 3 ♂♂, form II, 9 ♀♀, 13 juvenile ♂♂, and 7 juvenile ♀♀ in the collection of the senior author at the University of Virginia, and 1 ♂, form I, 4 ♂♂, form II, 8 juvenile ♂♂, and 4 juvenile ♀♀ are in the Tulane Collection.

Range.—In addition to the type locality, specimens are available from the following localities in Alabama. *Lowndes County*: Roadside ditch, 3.9 mi. S.W. of intersection of Rts. 11 and 80 on Rt. 11; Stream 32.4 mi. S. of Montgomery on U. S. Hwy. 31. *Montgomery County*: Roadside ditch 12.8 mi. S. of Montgomery on U. S. Hwy. 31; Roadside ditch 18.2 mi. E. of Montgomery on U. S. Hwy. 80; 2.5 mi. S.E. of junction of U.S. Hwy. 231 and Rt. 6; 3 mi. E. of Montgomery. *Macon County*: Stream and roadside ditch 0.8 mi. S. of Ft. Davis on U. S. Hwy. 29.

Relationships.—*Procambarus lewisi* has its closest affinities with *P. jaculus* Hobbs and Walton (1957: 48) but may be distinguished from it by the structure of the first pleopod and the bituberculate or knobbed hooks on the ischiopodites of the fourth pereopods of the first form male and by differences in the annulus ventralis of the female. The antennal scale is also broader in *P. lewisi* than in *P. jaculus*.

Remarks.—There is little variation among the 52 specimens available; most of the crayfish are comparatively small and a discussion of variations within the species must await the procurement of a series of larger, unquestionably mature, specimens.

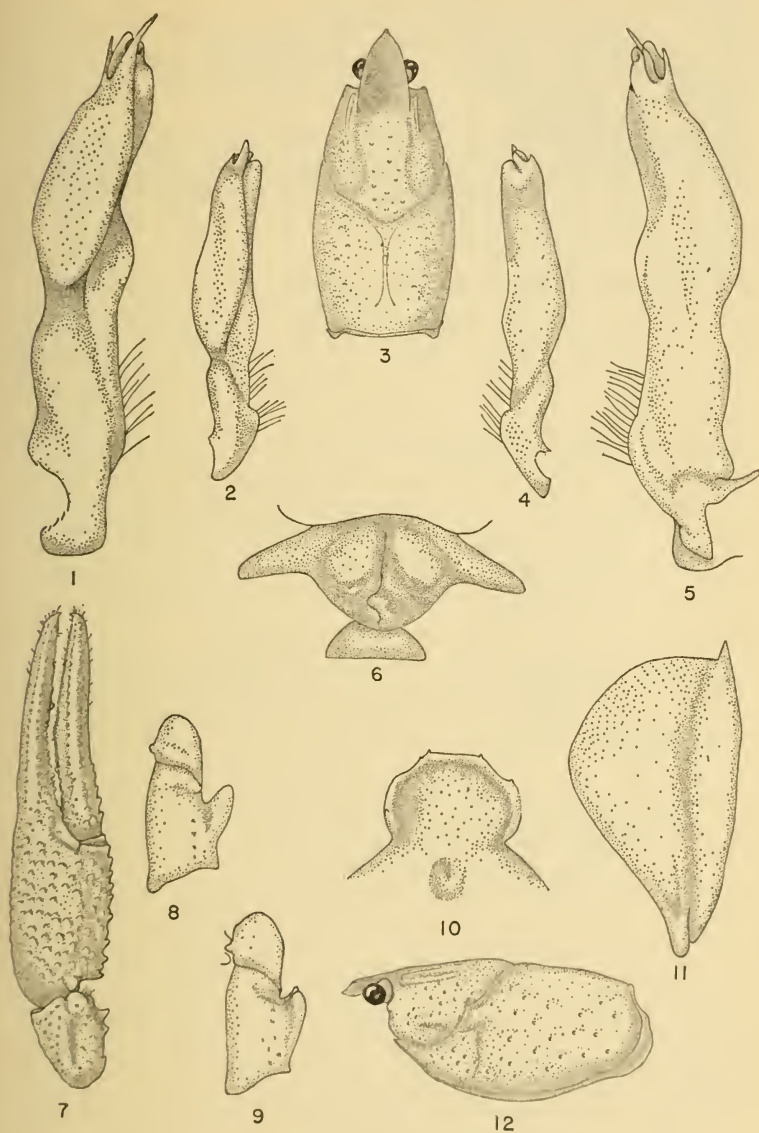
It seems probable that *P. lewisi* is a secondary burrower although most of the specimens were taken from open water. The fact that the majority of the individuals collected were young and were in company with other adult crayfish suggests that the more mature specimens were in burrows. Other species related to *P. lewisi* are known to be secondary burrowers—*P. planirostris* Penn (1953: 71), *P. hybus* Hobbs and Walton (1957: 39), and *P. manicus* Hobbs and Walton (1957: 44); also, the only specimens available of *P. jaculus* were taken from temporary water in a roadside ditch.

ACKNOWLEDGMENTS

We wish to express our appreciation to Dr. George H. Penn who has permitted us to examine the specimens of *P. lewisi* in the Tulane Zoological Collection and to Mr. Thomas L. Johnson of the University of Virginia who assisted in collecting most of the specimens on which this description is based.

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Explanation of Plates
Procambarus lewisi

- Fig. 1. Mesial view of first pleopod of holotype.
Fig. 2. Mesial view of first pleopod of morphotype.

- Fig. 3. Dorsal view of carapace of holotype.
Fig. 4. Lateral view of first pleopod of morphotype.
Fig. 5. Lateral view of first pleopod of holotype.
Fig. 6. Annulus ventralis of allotype.
Fig. 7. Distal podomeres of cheliped of holotype.
Fig. 8. Basipodite and Ischiopodite of third pereopod of holotype.
Fig. 9. Basipodite and Ischiopodite of fourth pereopod of holotype.
Fig. 10. Epistome of holotype.
Fig. 11. Antennal scale.
Fig. 12. Lateral view of carapace of holotype.